

CLAIMS

What is claimed is:

1. An apparatus for monitoring and control of a complex system comprising:
a plurality of sensors for monitoring a plurality of attributes of the complex system;
5 a table including a plurality of entries, each of the plurality of entries indicating at least one action to be taken in response to a portion of the plurality of attributes having particular values; and
a network processor coupled with the plurality of sensors and with the table, the network processor for receiving from the plurality of sensors a plurality of statuses for the plurality of attributes, the network processor further for determining at least one entry of the
10 plurality of entries to access based upon the plurality of statuses, and for accessing the at least one entry to determine a corresponding action.
2. The apparatus of claim 1 wherein the plurality of entries corresponds to a
15 plurality of values of a key, wherein the network processor further determines at least one corresponding value of the key based upon a portion of the plurality of statuses, the network processor determining the at least one entry by determining at least one match in the plurality of entries for the at least one corresponding value of the key.
- 20 3. The apparatus of claim 2 wherein the at least one corresponding value of the key is based upon the portion of the plurality of statuses from separate sensors of the plurality of sensors.

4. The apparatus of claim 2 wherein the at least one corresponding value of the key is based upon the portion of the plurality of statuses including more than one status from a single sensor of the plurality of sensors.

5. The apparatus of claim 1 further comprising:
a control station coupled to the plurality of sensors and the network processor, the control station receiving the plurality of statuses, placing the plurality of statuses in a plurality of packets and providing the plurality of packets to the network processor.

6. The apparatus of claim 5 wherein the control station places a portion of the statuses from separate sensors of the plurality of sensors into a packet of the plurality of packets.

7. The apparatus of claim 5 wherein the control station places a portion of the status into a packet of the plurality of packets, the portion of the statuses including more than one status from a single sensor of the plurality of sensors.

8. The apparatus of claim 6 or 7 wherein the packet has a plurality of status fields for storing the portion of the plurality of statuses.

9. The apparatus of claim 8 wherein the plurality of entries corresponds to a plurality of values of a key, wherein the network processor further determines at least one corresponding value of the key using a portion of the plurality of status fields, the network

processor determining the at least one entry by determining at least one match in the plurality of entries for the at least one corresponding value of the key.

10. The apparatus of claim 5 wherein the plurality of entries corresponds to a plurality of values of a key, wherein the network processor further determines at least one corresponding value of the key from a portion of the plurality of packets, the network processor determining the at least one entry by determining at least one match in the plurality of entries for the at least one corresponding value of the key.

11. The apparatus of claim 1 wherein the corresponding action includes issuing an alarm or a warning.

12. The apparatus of claim 1 wherein the corresponding action includes a dependent condition and wherein the network processor provides information to a system processor for further analysis.

13. The apparatus of claim 1 wherein the corresponding action includes continuing normal operation.

14. The apparatus of claim 1 wherein the corresponding action includes using at least one of the plurality of sensors for closely monitoring a portion of the plurality of attributes.

15. The apparatus of claim 1 wherein the table includes a CAM table.

16. The apparatus of claim 1 wherein the table includes a decision tree.

5 17. A method for monitoring and control of a system comprising the steps of:
receiving in a network processor a plurality of statuses for a plurality of attributes
from a plurality of sensors, the plurality of sensors for monitoring the plurality of attributes
of the system;

determining at least one entry of a plurality of entries in a table to access based upon
10 the plurality of statuses and using the network processor, each of the plurality of entries
indicating at least one action to be taken in response to a portion of the plurality of attributes
of the system having particular values; and

accessing the at least one entry using the network processor to determine the at least
one action.

15 18. The method of claim 17 wherein the plurality of entries corresponds to a
plurality of values of a key, wherein the step of determining the at least one entry further
includes the step of:

determining at least one corresponding value of the key based upon a portion of the
20 plurality of statuses; and

determining at least one match in the plurality of entries for the at least one
corresponding value of the key.

19. The method of claim 18 wherein the at least one corresponding value of the key is based upon the portion of the plurality of statuses from separate sensors of the plurality of sensors.

5 20. The method of claim 18 wherein the at least one corresponding value of the key is based upon the portion of the plurality of statuses including more than one status from a single sensor of the plurality of sensors.

21. The method of claim 17 further comprising the step of:
10 placing the plurality of statuses in a plurality of packets; and
 providing the plurality of packets to the network processor.

22. The method of claim 21 wherein the placing step further includes the step of:
 placing a portion of the statuses from separate sensors of the plurality of sensors into
15 a packet of the plurality of packets.

23. The method of claim 21 wherein the placing step further includes the step of:
 placing more than one status from a single sensor of the plurality of sensors.

20 24. The method of claim 22 or 23 wherein the packet has a plurality of status fields for storing the portion of the plurality of statuses.

25. The method of claim 24 wherein the plurality of entries corresponds to a plurality of values of a key;

wherein the corresponding valued of the key determining step further includes the step of using a portion of the plurality of status fields to determine the status of the key; and

5 wherein the at least one match determining step further includes the step of determining the at least one entry by determining at least one match in the plurality of entries for the at least one corresponding value of the key.

26. The method of claim 21 wherein the plurality of entries corresponds to a plurality of values of a key, wherein the at least one corresponding value of the key
10 determining step further includes the step of determining the at least one corresponding value of the key from a portion of the plurality of packets; and

wherein the at least one determining step further includes the step of using the network processor to determine at least one match in the plurality of entries for the at least
15 one corresponding value of the key.

27. The method of claim 17 wherein the corresponding action includes issuing an alarm or a warning.

28. The method of claim 17 wherein the corresponding action includes a
20 dependent condition and wherein the network processor provides information to a system processor for further analysis.

29. The method of claim 17 wherein the corresponding action includes continuing normal operation.

30. The method of claim 17 wherein the corresponding action includes using at least one of the plurality of sensors for closely monitoring a portion of the plurality of attributes.

31. The method of claim 17 wherein the table includes a CAM table.

32. The method of claim 17 wherein the table includes a decision tree.

33. The method of claim 17 further comprising the step of:
implementing the at least one action.

34. A computer-readable medium containing a program for monitoring and control of a system, the program including instructions for:

receiving in a network processor a plurality of statuses for a plurality of attributes from a plurality of sensors, the plurality of sensors for monitoring the plurality of attributes of the system;

determining at least one entry of a plurality of entries in a table to access based upon the plurality of statuses and using the network processor, each of the plurality of entries indicating at least one action to be taken in response to a portion of the plurality of attributes of the system having particular values; and

accessing the at least one entry using the network processor to determine the at least one action.

35. The computer-readable medium of claim 34 wherein the plurality of entries
5 corresponds to a plurality of values of a key, wherein the instructions for determining the at least one entry further includes the step of:

determining at least one corresponding value of the key based upon a portion of the plurality of statuses; and

determining at least one match in the plurality of entries for the at least one
10 corresponding value of the key.

36. The computer-readable medium of claim 35 wherein the at least one
corresponding value of the key is based upon the portion of the plurality of statuses from
separate sensors of the plurality of sensors.

37. The computer-readable medium of claim 35 wherein the at least one
corresponding value of the key is based upon the portion of the plurality of statuses
including more than one status from a single sensor of the plurality of sensors.

38. The computer-readable medium of claim 35 wherein the program further
20 includes the further comprising:

placing the plurality of statuses in a plurality of packets; and

providing the plurality of packets to the network processor.

39. The computer-readable medium of claim 34 wherein the placing instructions includes the instructions for

placing a portion of the statuses from separate sensors of the plurality of sensors into a packet of the plurality of packets.

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40. The computer-readable medium of claim 34 wherein the instructions for placing step further includes the step of:

placing more than one status from a single sensor of the plurality of sensors.

10 41. The computer-readable medium of claim 39 or 40 wherein the packet has a plurality of status fields for storing the portion of the plurality of statuses.

42. The computer-readable medium of claim 41 wherein the plurality of entries corresponds to a plurality of values of a key;

15 wherein the corresponding valued of the key determining instructions further includes instructions for using a portion of the plurality of status fields to determine the status of the key; and

wherein the at least one match determining instructions further includes instructions for of determining the at least one entry by determining at least one match in the plurality of
20 entries for the at least one corresponding value of the key.

43. The computer-readable medium of claim 36 wherein the plurality of entries corresponds to a plurality of values of a key, wherein the at least one corresponding value of

the key determining instructions further includes instructions for determining the at least one corresponding value of the key from a portion of the plurality of packets; and

wherein the at least one determining instructions further includes the instructions for using the network processor to determine at least one match in the plurality of entries for the at least one corresponding value of the key.

44. The computer-readable medium of claim 34 wherein the corresponding action includes issuing an alarm or a warning.

45. The computer-readable medium of claim 34 wherein the corresponding action includes a dependent condition and wherein the network processor provides information to a system processor for further analysis.

46. The computer-readable medium of claim 34 wherein the corresponding action includes continuing normal operation.

47. The computer-readable medium of claim 34 wherein the corresponding action includes using at least one of the plurality of sensors for closely monitoring a portion of the plurality of attributes.

48. The computer-readable medium of claim 34 wherein the table includes a CAM table.

49. The computer-readable medium of claim 34 wherein the table includes a decision tree.